

Pushing the Envelope			
2004 Science			
Standard Course of Study			
North Carolina Science			
Grade 5			
Activity/Lesson	State	Standards	
Physics and Math (pgs. 43-63)	NC	SCI.5.4.04	Determine that an unbalanced force is needed to move an object or change its direction.
Physics and Math (pgs. 43-63)	NC	SCI.5.4.05.a	Determine factors that affect motion including: Force.
Rocket Activity (pgs. 69-75)	NC	SCI.5.4.04	Determine that an unbalanced force is needed to move an object or change its direction.
Rocket Activity (pgs. 69-75)	NC	SCI.5.4.05.a	Determine factors that affect motion including: Force.
Pushing the Envelope			
2004 Science			
Standard Course of Study			
North Carolina Science			
Grade 7			
Activity/Lesson	State	Standards	
Types of Engines (pgs. 11-23)	NC	SCI.7.6.05.c	Describe and measure quantities that characterize moving objects and their interactions within a system: Mass.
Types of Engines (pgs. 11-23)	NC	SCI.7.6.05.e	Describe and measure quantities that characterize moving objects and their interactions within a system: Velocity.
Physics and Math (pgs. 43-63)	NC	SCI.7.6.03.a	Evaluate motion in terms of Newton's Laws: The force of friction retards motion.
Physics and Math (pgs. 43-63)	NC	SCI.7.6.03.b	Evaluate motion in terms of Newton's Laws: For every action there is an equal and opposite reaction.
Physics and Math (pgs. 43-63)	NC	SCI.7.6.03.c	Evaluate motion in terms of Newton's Laws: The greater the force, the greater the change in motion.
Physics and Math (pgs. 43-63)	NC	SCI.7.6.03.d	An object's motion is the result of the combined effect of all forces acting on the object:
Physics and Math (pgs. 43-63)	NC	SCI.7.6.03.f	Evaluate motion in terms of Newton's Laws: An object at rest will remain at rest.
Physics and Math (pgs. 43-63)	NC	SCI.7.6.05.b	Describe and measure quantities that characterize moving objects and their interactions within a system: Distance.
Physics and Math (pgs. 43-63)	NC	SCI.7.6.05.d	Describe and measure quantities that characterize moving objects and their interactions within a system: Force.
Rocket Activity (pgs. 69-75)	NC	SCI.7.6.03.a	Evaluate motion in terms of Newton's Laws: The force of friction retards motion.
Rocket Activity (pgs. 69-75)	NC	SCI.7.6.03.b	Evaluate motion in terms of Newton's Laws: For every action there is an equal and opposite reaction.
Rocket Activity (pgs. 69-75)	NC	SCI.7.6.03.c	Evaluate motion in terms of Newton's Laws: The greater the force, the greater the change in motion.

Rocket Activity (pgs. 69-75)	NC	SCI.7.6.03.d	Evaluate motion in terms of Newton's Laws: An object's motion is the result of the combined effect of all forces acting on the object.
Rocket Activity (pgs. 69-75)	NC	SCI.7.6.03.f	Evaluate motion in terms of Newton's Laws: An object at rest will remain at rest.
Rocket Activity (pgs. 69-75)	NC	SCI.7.6.05.b	Describe and measure quantities that characterize moving objects and their interactions within a system: Distance.
Rocket Activity (pgs. 69-75)	NC	SCI.7.6.05.d	Describe and measure quantities that characterize moving objects and their interactions within a system: Force.

Pushing the Envelope

2004 Science

Standard Course of Study

North Carolina Science

Grades 9-12 (Physical Science)

Activity/Lesson	State	Standards	
Physics and Math (pgs. 43-63)	NC	SCI.9-12.PS.2.02.a	In the absence of a force, an object in motion will remain in motion or an object at rest will remain at rest until acted on by an unbalanced force.
Physics and Math (pgs. 43-63)	NC	SCI.9-12.PS.2.02.b	Change in motion of an object (acceleration) is directly proportional to the unbalanced outside force and inversely proportional to the mass.
Physics and Math (pgs. 43-63)	NC	SCI.9-12.PS.2.02.c	Whenever one object exerts a force on another, an equal and opposite force is exerted by the second on the first.
Physics and Math (pgs. 43-63)	NC	SCI.9-12.PS.3.02.a	Investigate and analyze transfer of energy by work: Force.
Physics and Math (pgs. 43-63)	NC	SCI.9-12.PS.3.02.b	Investigate and analyze transfer of energy by work: Distance.
Rocket Activity (pgs. 69-75)	NC	SCI.9-12.PS.2.02.a	In the absence of a force, an object in motion will remain in motion or an object at rest will remain at rest until acted on by an unbalanced force.
Rocket Activity (pgs. 69-75)	NC	SCI.9-12.PS.2.02.b	Change in motion of an object (acceleration) is directly proportional to the unbalanced outside force and inversely proportional to the mass.
Rocket Activity (pgs. 69-75)	NC	SCI.9-12.PS.2.02.c	Whenever one object exerts a force on another, an equal and opposite force is exerted by the second on the first.
Rocket Activity (pgs. 69-75)	NC	SCI.9-12.PS.3.02.a	Investigate and analyze transfer of energy by work: Force.
Rocket Activity (pgs. 69-75)	NC	SCI.9-12.PS.3.02.b	Investigate and analyze transfer of energy by work: Distance.

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2004 Science

Standard Course of Study

North Carolina Science

Grades 9-12 (Physics)

Activity/Lesson	State	Standards	
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Types of Engines (pgs. 11-23)	NC	SCI.9-12.PH.4.03	Assess, measure, and calculate the relationship among the force acting on a body, the mass of the body, and the nature of the acceleration produced (Newton's Second Law of Motion).
Types of Engines (pgs. 11-23)	NC	SCI.9-12.PH.5.01	Assess the vector nature of momentum and its relation to the mass and velocity of an object.
Physics and Math (pgs. 43-63)	NC	SCI.9-12.PH.4.01	Determine that an object will continue in its state of motion unless acted upon by a net outside force (Newton's First Law of Motion, The Law of Inertia).
Physics and Math (pgs. 43-63)	NC	SCI.9-12.PH.4.02	Assess, measure and calculate the conditions required to maintain a body in a state of static equilibrium.
Physics and Math (pgs. 43-63)	NC	SCI.9-12.PH.4.03	Assess, measure, and calculate the relationship among the force acting on a body, the mass of the body, and the nature of the acceleration produced (Newton's Second Law of Motion).
Physics and Math (pgs. 43-63)	NC	SCI.9-12.PH.4.04	Analyze and mathematically describe forces as interactions between bodies (Newton's Third Law of Motion).
Physics and Math (pgs. 43-63)	NC	SCI.9-12.PH.4.05	Assess the independence of the vector components of forces.
Rocket Activity (pgs. 69-75)	NC	SCI.9-12.PH.4.01	Determine that an object will continue in its state of motion unless acted upon by a net outside force (Newton's First Law of Motion, The Law of Inertia).
Rocket Activity (pgs. 69-75)	NC	SCI.9-12.PH.4.02	Assess, measure and calculate the conditions required to maintain a body in a state of static equilibrium.
Rocket Activity (pgs. 69-75)	NC	SCI.9-12.PH.4.04	Analyze and mathematically describe forces as interactions between bodies (Newton's Third Law of Motion).
Rocket Activity (pgs. 69-75)	NC	SCI.9-12.PH.4.05	Assess the independence of the vector components of forces.
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2004 Science			
Standard Course of Study			
North Carolina Science			
Grades 9-12 (AP Physics B)			
Activity/Lesson	State	Standards	
Physics and Math (pgs. 43-63)	NC	SCI.9-12.PB.2.02.a	Investigate, measure, and analyze Newton's laws of motion: Static equilibrium (first law).
Physics and Math (pgs. 43-63)	NC	SCI.9-12.PB.2.02.b	Investigate, measure, and analyze Newton's laws of motion: Dynamics of a single particle (second law).
Physics and Math (pgs. 43-63)	NC	SCI.9-12.PB.2.02.c.1	Investigate, measure, and analyze Newton's laws of motion: Velocity with constant force and average force.
Physics and Math (pgs. 43-63)	NC	SCI.9-12.PB.2.02.c.2	Investigate, measure, and analyze Newton's laws of motion: Force diagram.

Physics and Math (pgs. 43-63)	NC	SCI.9- 12.PB.2.02.e	Investigate, measure, and analyze Newton's laws of motion: Action and reaction forces on two or more bodies (third law).
Physics and Math (pgs. 43-63)	NC	SCI.9- 12.PB.2.02.f	Investigate, measure, and analyze Newton's laws of motion: Tension.
Physics and Math (pgs. 43-63)	NC	SCI.9- 12.PB.2.03.b	Examine and calculate work, energy and power: Conservative forces and potential energy.
Rocket Activity (pgs. 69-75)	NC	SCI.9- 12.PB.2.02.c.1	Investigate, measure, and analyze Newton's laws of motion: Velocity with constant force and average force.
Rocket Activity (pgs. 69-75)	NC	SCI.9- 12.PB.2.02.c.2	Investigate, measure, and analyze Newton's laws of motion: Force diagram.
Rocket Activity (pgs. 69-75)	NC	SCI.9- 12.PB.2.02.e	Investigate, measure, and analyze Newton's laws of motion: Action and reaction forces on two or more bodies (third law).
Rocket Activity (pgs. 69-75)	NC	SCI.9- 12.PB.2.02.f	Investigate, measure, and analyze Newton's laws of motion: Tension.
Rocket Activity (pgs. 69-75)	NC	SCI.9- 12.PB.2.03.b	Examine and calculate work, energy and power: Conservative forces and potential energy.